

Learning Goals and Strategies in the Self-regulation of Learning

Martha Leticia Gaeta González

Universidad Popular Autónoma del Estado de Puebla, Puebla, México

In order to self-regulate their learning, students need to use different strategies to plan, monitor, and evaluate their learning activities (meta-cognitive strategies), as well as to control their motivation and emotion (volitional strategies). Students' effectiveness in their self-regulated learning process also varies depending on the academic environment and students' personal goal orientations. In this study, the author analyzed the interactions between these cognitive, volitional, and motivational variables in late adolescence. To achieve this goal, the author proposed a model by means of SEM (Structural Equation Modeling). The investigation was developed with 268 4th-grade secondary school students, from public and private schools, in a northwestern city in Spain. Analysis of the proposed model showed the following results: the perception of a classroom learning goal structure relates significantly to a personal learning goal orientation, and the latter relates positively to the use of meta-cognitive strategies, the use of volitional strategies has a mediating effect between a learning goal orientation and the use of meta-cognitive strategies. Results are discussed in detail in the document.

Keywords: learning goals, meta-cognitive strategies, SRL (self-regulated learning)

Introduction

In the academic context, teachers face the challenge of promoting students' integral development, through the acquisition of knowledge and skills that can be adapted throughout the different stages of their life. For which education is viewed as a process, in which students must become more self-regulated as learners. SRL (Self-Regulated Learning) should not be viewed as a mental ability or an academic performance skill, but rather as a self-directed process in which students transform their mental abilities into academic skills. It refers to self-generated thoughts, affect and behavior that are oriented towards the achievement of their goals, with the interaction of environmental conditions (Zimmerman, 2002).

In this context, meta-cognitive processes, such as planning, monitoring, and evaluation promote students' SRL. Conceptually, meta-cognition consists of the personal awareness, knowledge, and regulation of one's cognitive processes (Brown, 1987). While, cognitive strategies are used to help an individual achieve a particular goal (e.g., solving a problem), meta-cognitive strategies are used to ensure that the goal has been reached (e.g., evaluating one's understanding of that problem).

Moreover, between the intention of achieving a goal and implementing activities to achieve it, there are a number of cognitive and meta-cognitive factors, related to the control of these activities, which may facilitate or impede its implementation. So, students' abilities to use strategies that help them to direct their motivation towards action, in the set-goal direction, are a central aspect of SRL (Wolters, Pintrich, & Karabenick, 2003). Specifically, volitional strategies for maintaining motivation and effort towards goals, as well as for controlling

negative emotions, are interrelated and jointly involved in the self-regulation of learning (Boekaerts, 1995).

Also, students' effectiveness in the process of SRL varies depending on the academic environment and their personal goal orientations. Specifically, perceptions of a learning-oriented classroom structure are positively related to more adaptive learning patterns, such as the use of effective learning strategies, as well as to involvement in the class, motivation, effort, affective states, and eventually academic achievement (Sideridis, 2005). In contrast, a performance-oriented classroom structure has been associated with negative learning patterns (Ryan, Gheen, & Midgley, 1998).

Based on the above, this paper proposes a model, using SEM (Structural Equation Modeling) to examine the interactions between the classroom goal structure, personal goal orientation, and the use of volitional and meta-cognitive strategies in 4th-grade secondary school students.

Method

Participants

A total of 268 4th-grade secondary school students, ranging in age from 15 to 16 years, from public ($n = 129$) and private ($n = 139$) schools, participated in this investigation. Stratified random sampling was used in the study.

Instruments

Students' perceptions of their classroom goal structure and their goal orientation were assessed by means of the corresponding questionnaire sections from the PALS (Patterns of Adaptive Learning Survey) (Midgley et al., 2000). This instrument contains three subscales that measure students' perceptions of the meaning of academic tasks and achievement that are emphasized in the classroom. The questionnaire also provides an evaluation of three general types of personal academic goals.

Volitional variables were measured by means of the AVSI (Academic Volitional Strategy Inventory) (McCann & Turner, 2004). This instrument measures the extent to which students engage in motivational regulation strategies for controlling their motivation and emotional states, as they initiate and attempt to maintain action on academic requirements.

The use of meta-cognitive strategies was evaluated through the corresponding scale from the MSLQ (Motivated Strategies for Learning Questionnaire) (Pintrich, Smith, García, & McKeachie, 1991). This scale measures the extent to which students use strategies to control and regulate their own cognition.

Procedure and Data Analyses

All the assessment instruments were administered to the students in their classroom, in one session, during the normal academic schedule. Students were assured that their answers would be kept confidential.

SEM was utilized to determine how well the proposed theoretical model fit the research data. For the analyses, the author used the LISREL (Linear Structural Relations) 8.80 computer program (Jöreskog & Sörbom, 2006).

Model to Be Investigated

The proposed model and the relationships between the corresponding variables are displayed in Figure 1. From a general perspective, in the research model, it is hypothesized that:

(1) Classroom performance-approach goal structure and classroom performance-avoid goal structure would positively relate to performance goal orientation;

- (2) Performance goal orientation would be positively related to volitional strategies and to meta-cognitive strategies;
- (3) Classroom mastery goal structure would be positively associated to mastery goal orientation;
- (4) Mastery goal orientation would positively relate to meta-cognitive strategies;
- (5) Volitional strategies would mediate the relationship between mastery goal orientation and meta-cognitive strategies.

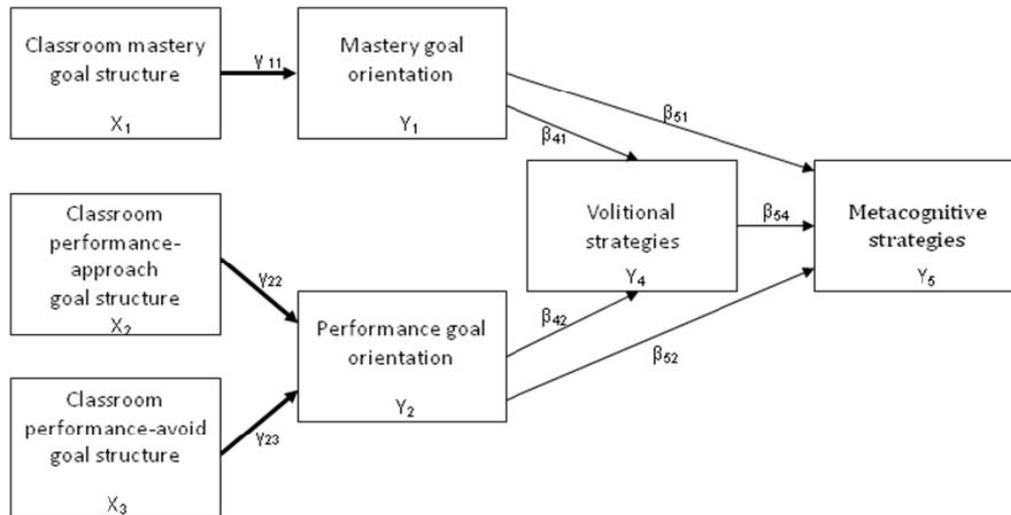


Figure 1. Graphic representation of the proposed model.

Results

Based on the fit indices, the hypothesized model fit the data quite well. The RMSEA (Root Mean Square Error of Approximation) = $0.053_{(0.034, 0.069)}$ shows an appropriate value. Data provided by other indices also offer support for the acceptance of the model proposed in this study: NNFI (Non-Normed Fit Index) = 0.93; CFI (Comparative Fit Index) = 0.97; GFI (Goodness-of-Fit Index) = 0.94; AGFI (Adjusted Goodness-of-Fit Index) = 0.90. Furthermore, the SRMR (Standardised Root Mean Square Residual) = 0.06 indicates an acceptable mean residual correlation. Finally, the $\chi^2/df = 1.74$, that provides information on the parsimony of the model, shows an excellent level.

Despite the good fit of the tested model, the results suggested that there was room for improvement. A close examination of the estimated parameters' significances and the hypothetical relevance of those not estimated (observed through modifying indexes and standardized residuals) led us to modify the proposed model: the path showing the hypothetical association between the classroom performance-approach goal structure and the performance goal orientation was deleted ($\gamma = 0.05$; $t = 0.74$), also the path showing the relationship between the performance goal orientation and volitional strategies ($\beta = 0.01$; $t = 0.15$) was eliminated, since they both were not significant. Also, a path showing the link between volitional strategies and the performance goal orientation was included for its estimation ($\beta = 0.18$; $t = 2.23$).

The new tested model was both conceptually meaningful and provided good results on the model fit (RMSEA = $0.052_{(0.035, 0.068)}$, NNFI = 0.96; CFI = 0.97; GFI = 0.94; AGFI = 0.91; SRMR = 0.06; $\chi^2/df = 1.71$) and at the specific parameters' estimation level. The obtained results (standardized data) regarding the specific relations between the different variables are shown in Figure 2.

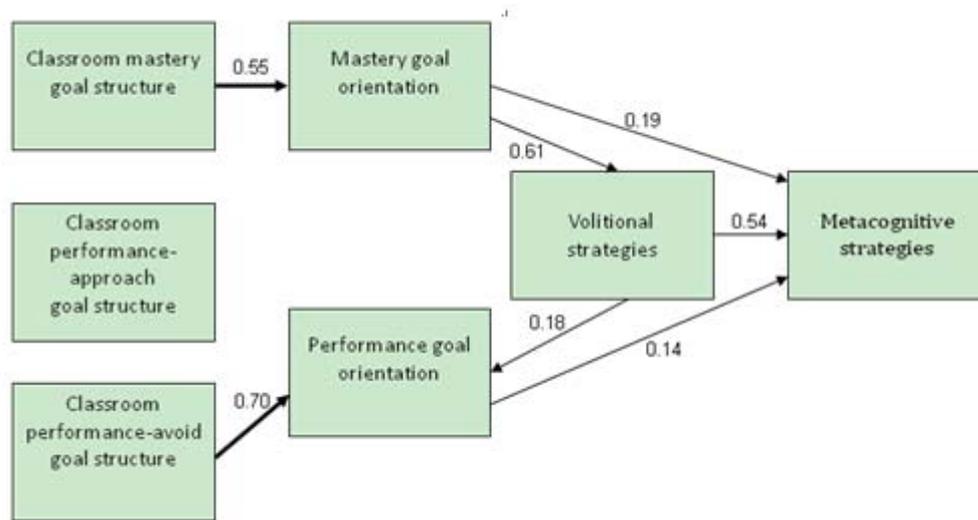


Figure 2. Path coefficients of the proposed relationships in the model (standardized results).

The obtained results confirm totally or partially the hypotheses used for the construction of the model. First, classroom performance-avoid goal structure significantly relates to performance goal orientation ($\gamma = 0.70$; $t = 8.47$), however, this is not the case for the classroom performance-approach goal structure and performance goal orientation ($\gamma = 0.05$; $t = 0.74$). Second, performance goal orientation is significantly associated to meta-cognitive strategies ($\beta = 0.14$; $t = 2.14$), but not to volitional strategies ($\beta = 0.01$; $t = 0.15$). Third, classroom mastery goal structure is significantly related to mastery goal orientation ($\gamma = 0.55$; $t = 5.39$). Fourth, mastery goal orientation significantly relates to meta-cognitive strategies ($\beta = 0.19$; $t = 2.08$). Fifth, volitional strategies have a significant mediating effect between mastery goal orientation and meta-cognitive strategies (standardized indirect coefficient = 0.33, $p < 0.05$). Additionally, volitional strategies influence performance goal orientation ($\beta = 0.18$; $t = 2.23$).

Conclusions

The analyses of the relationships between the model variables reveal the following results: classroom mastery goal structure predicts mastery goal orientation; classroom performance-avoid goal structure and volitional strategies explain performance goal orientation; mastery goal orientation and performance goal orientation explain meta-cognitive strategies; volitional strategies mediate the relationship between mastery goal orientation and meta-cognitive strategies.

From the above, it can be concluded that students' perception of the classroom structure is an important factor for the development of their personal goal orientation (Ames, 1992). Goal orientation, in turn, appears to define the strategies that students use to take responsibility (or not) for persevering towards their goals attainment, by controlling their motivation and emotion (Wolters & Rosenthal, 2000). This effort and persistence for goal achievement has a positive effect on the use of strategies to control and direct their mental processes for the SRL.

Contrary to the author's expectation, a classroom performance goal structure does not influence students' performance goal orientations, which indicates that the students in this study perceive that the goal for engaging in academic work is not to prove competence (for example, get good grades), but to avoid demonstrating lack

of competence (for example, not to be the worst in class), which leads them to compare themselves to others and to avoid demonstrating any lack of ability (performance orientation).

According to the proposed model, volitional strategies have an important mediating role between mastery goal orientation and meta-cognitive strategies. This indicates that learning-oriented students are more likely to find a link between their efforts and their results, and work to reduce or avoid both internal and external distractions (Pintrich & Schunk, 2006), showing higher levels of persistence, compared to performance-oriented students. This use of motivational and emotional control strategies will produce, as a result, a greater commitment to learning and to the use of cognitive control strategies.

Based on the results of this study, the author emphasizes the importance of helping adolescents in the acquisition of a greater sense of independence and self-confidence, through building classroom environments that empower learners to regulate their learning experience. As it is seen, students' perceptions of a learning-oriented classroom structure are positively related to a greater academic involvement (Sideridis, 2005), through a mastery goal orientation. Moreover, it can be emphasized that teachers should promote the use of volitional strategies to help students maintaining their interest and focus on learning, as well as their emotional balance in order to become cognitive engaged.

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